PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Improving developmental and educational support for children born preterm: Evaluation of an e-learning resource for education professionals
AUTHORS	Johnson, Samantha; Bamber, Deborah; Bountziouka, Vasiliki; Clayton, Sarah; Cragg, Lucy; Gilmore, Camilla; Griffiths, Rose; Marlow, Neil; Simms, Victoria; Wharrad, Heather

VERSION 1 - REVIEW

REVIEWER	Sabrina Twilhaar Vrije Universiteit Amsterdam, The Netherlands
REVIEW RETURNED	27-Feb-2019

GENERAL COMMENTS	This study evaluated the efficacy of an e-learning resource that was aimed to improve teacher's knowledge of developmental and educational outcomes of children born preterm and teacher's confidence to support these children in the classroom. With the development of this resource, the authors fulfilled the need for an evidence-based resource for those who work with preterm born children and on whom we actually rely with respect to the identification of problems in this population, given that the routine follow up of preterm born children is generally limited to the infancy period. The article is well-written and the e-learning resource seems particularly well-designed. I appreciate the involvement of important stakeholders in the development process, which increases the likelihood that the resource fits the needs of the target population. My comments and considerations are as follows: 1. The focus of the introduction is mainly on academic difficulties after preterm birth. However, children born preterm show difficulties across a wide range of developmental domains. Although participants of the present study were teachers, they are not only concerned with the academic progress of their pupils. Fortunately, the e-learning was not exclusively focused on academic outcomes, but also on cognitive, motor, behavioral, social, and emotional outcomes after preterm birth. However, that only became clear after reading the Methods section and the Appendix. I think it is important to take a broader view on the consequences of preterm birth in the Introduction, so that the Introduction provides support for the content of the e-learning resource. 2. Introduction, third paragraph: It would be clearer to state that the aim was not to improve knowledge of preterm birth, but knowledge of the consequences of preterm birth (or both), as this is what the e-learning is mainly about, according to Table S1.

	3. Unfortunately, the resource was not yet accessible at the time of reviewing this manuscript. The paper itself does not provide much information about the content of the e-learning resource. Is the content of the e-learning directly linked to the items of the PB-KS? Does the resources provide explanations of what for example cerebral palsy, working memory, ADHD, and ASD is? If someone is taught that children born preterm are likely to have working memory deficits without knowing what working memory actually is or how such problems are actually reflected in daily life functioning, it is less likely that this specific knowledge will have an impact on the support and outcomes of children. I assume the resource does include such explanations and does not literally present the information that is asked for by the items of the PB-KS, but my point is that this does not become fully clear from reading the paper. My suggestion therefore is to provide more information about the content of the e-learning resource. From Table S3 (item 8), I infer that for each section of the e-learning resource (the 5 RLOs?) learning objectives were formulated. It would be informative to the reader to provide such information in the paper. I would suggest to at least name the subjects of the RLOs in the Methods section and to expand Table S1 with the specific learning objective and/or a short summary of the content of each section. 4. Which strategies were provided to teachers to support preterm born children in the classroom? Are these strategies that have been found to be effective in the general population or other clinical populations? Can these strategies be broadly applied (e.g. in different school settings, across grades, in different countries, etc.)? 5. Teachers were asked whether they would consider prematurity when encountering a child struggling at school (Figure 1). However, the other way around may be even more important: being aware of the developmental and learning difficulties that are commonly associated with preterm birth when having a preterm born child in your classroom. As the authors state in their Discussion, it is increasingly the role of teachers to identify preterm born children with difficulties and to initiate support. To this end, it may be more effective that teachers are aware of the preterm birth status of children in their classroom, so that (subtle) difficulties may be identified at an early stage, instead of considering preterm birth when problems are already evident. Table 1 suggests that many teachers (34%) do not know whether children are born preterm or not. If we expect teachers to identify preterm born children with difficulties, preferably at an early stage (whether this is a fair expectation or not), should teachers then not be aware of the birth status at school entry? Does the e-learning resource provide any advice on this? 6. While 120 teachers consented to participate in the study, only 61 completed the e-learning and questionnaires. Do the authors have an idea why about half of the potential participants did not participate in the end? Is it possible that teachers who already had some knowledge on preterm birth outcomes were more likely to finish the pre-resource questionnaire, while those without any knowledge were scared off by the questions or ashamed that they could not answer them? Would the teachers who did not finish the

	pre-resource questionnaire still be interested to access the e-learning resource outside the study setting or could it indicate that e-learning itself is not appealing to a large proportion of teachers? In other words, could the high drop-out rate have biased the results of the study in any way? I think some discussion on this issue should be added to the limitations section in the Discussion.

REVIEWER	Ann-Mari Brubakk NTNU - Norwegian University of Science and Technology Norway
REVIEW RETURNED	06-Mar-2019

GENERAL COMMENTS	Review of the paper: Improving developmental and educational support for children born preterm. An impressive group of psychologists, educational experts, medical specialists, and researchers are the authors of this paper. The authors have developed an interactive e-learning resource for educational professionals with the aim to increase their knowledge of the impact of preterm birth on the children's ability to learn and to enhance the outcome of education for children born preterm. This may be a very big and novel step forward for the education of these children and the authors are to be congratulated on the initiative. The abstract gives a good overview over the design of the development of the e-resource, the results and the relevance of the paper. In the relevance section, the authors emphasize that the special educational needs and poorer academic attainment is a risk for children born preterm and may have a lifelong impact on their lives. The aim has been to increase teacher's knowledge of the impact of preterm birth on learning and social skills by use of the e-learning resource. They also emphasize that further research is needed to evaluate whether this will lead to better learning in school for the children born preterm. In the introduction, the authors describe previous knowledge of learning difficulties in preterm born children and the earlier in pregnancy the children are born, the higher the risk for special educational needs and support in school. However, also children born later in pregnancy can have the same difficulties and may get less attention by teachers. The authors point out that the future of preterm born children are dependent on teachers with knowledge of their learning difficulties and that recent literature show that such knowledge is lacking. This is the background for the development of the e-learning research in the present study. The Methods section is divided into Participants, Procedure, Preterm birth e-learning resource, Patient and Public involvement and Measures. The participants and how they can enter the e-learning resource comes before development of the resource. The six subtopics of the methods indicate an impressive amount of work laid down by the researchers and all other participants in making the study a success. Participants The head teachers of the various schools invited the teachers to participate. Involving the head teacher seems a very smart way of securing optimal participation. The number of possible participating teachers is not given. While many teachers agreed to participate, only half of them entered the study. Together, this may imply selection bias. Procedure

	After Formalities, the participants had to set up a personal account on an open-source learning platform, fill in study questionnaires and access the e-learning resource. They then had to log into their account to complete the pre-resource use questionnaires and finally got access to the e-learning resource. When finishing using the resource, they filled in a post resource questionnaire on the online platform. Six participants (10%) had trouble using the platform and needed help. Some potential participants may have been discouraged by the procedure before trying to use the e-learning platform. The authors do not mention whether help or a training course was available for participants. Preterm birth e-learning resource. This section describes the development of the interactive e-learning object that stimulates to active learning and skills within the area of cognitive, mathematics and social-emotional difficulties, learning problems typical for children born preterm. This is probable a very rewarding and interesting way of learning and facilitate frequent use. For the development of the e-learning resource, educational professionals and psychologists, but also parents of children and young adults born preterm were included in creating the resource. For parents and preterm born adults, this must be a dream come true, many of them have struggled to inform teachers about their children's problems with varying success. All participated in building the content of the resource with feedback to the participants, including parents of preterm born children and preterm born adults. This means that they included the real life experts on the impact of preterm birth on learning problems and social skills. The inclusion of the real-life experts also increases the chances that better teaching will lead better school outcome and more integration in society by this group. Measures To assess the knowledge the participant teachers had of preterm born children and their problems before and after using the e-learning resource, the authors used the Preterm Birth Knowledge Scale (PB-KS). To assess confidence in supporting learning of children born preterm, the authors used a 5-point Likert scale used in similar studies before. The authors also collected information about age, experience in teaching, professional roles and gender, information that may influence the results. Statistics Appropriate statistics was used to analyze the data. Results Although 120 teachers agreed to participate, only 71 filled in the pre-resource questionnaire, while ten more left after filling in the questionnaire. One may speculate whether these teachers found the procedure of entering the e-learning resource too difficult, the age of the teacher may also play a role. Almost all of the participating education professionals had some knowledge of children born preterm and most of them were females. This may also have had some influenced the results of the study. The participants were teaching children from 5-11 years. The authors do not mention why they did not include teachers for older children. Learning material for older children include more abstract and difficult topics and children with preterm background are often in need of extra support to finish school. A reason for not including teachers of older children may be that a new e-learning resource would have to be developed for teachers of older children.

	However, with improved and focused teaching in younger classes, the children may have a better base for handling more advanced material in higher classes and give them an advantage compared to children without earlier support. Knowledge of preterm birth A highly significant increase in PB-KS score was seen after the participants had used the e-learning source compared to before. These results are very encouraging and indicate that the use of the e-learning platform may help both preterm born children, teachers and parents. Problems with mathematics had highest score for increased knowledge by the participants. This is encouraging since problems with mathematics is the most common learning problem in children born preterm. The participants also scored high on the topics of social skills, inattention and visuospatial deficits after training. For understanding the child, these areas are important, but some of these areas, like visuospatial deficits may be difficult to improve by more targeted teaching since this may be caused by altered brain structures involving both brain and eyes. The PB-KS scores does not indicate which answer is the right one, and may cause some confusion by the participants. Some with little or no knowledge of the impact of prematurity may believe that that 20% of the children are blind or deaf or that all preterm born children born very early have cerebral palsy. Confidence in supporting the children born preterm Confidence in teaching the preterm born children also showed a large significant increase, 93% of the teachers felt confident after using the e-learning resource versus 23% before. This is an important effect, laying the basis for their teaching initiative and effort. They also indicated that they would ask a struggling child whether he or she was born preterm. In young children, it would be advisable to ask the parents instead, in order to avoid over-focusing on the child's problems in the class. Also, other pupils could start to mob the child if they found out. Asking the child may also be difficult, because for instance alcohol use in pregnancy may result in similar learning problems in children. Utility of the learning resource Despite problems with using the e-resource for some participants, 93% would recommend the resource to others and between 92%-100% of the participants in the study gave an extremely positive evaluation of the resource. This may indicate that the e-resource described in this study can also be used in the education of new teachers. This would benefit more children with similar learning problems. Discussion. The discussion is very well written and contains the benefits and potential problems of the study. The authors emphasize that using the e-learning resource increases the knowledge of the specific educational needs for children born preterm and that almost 100% of the teachers rated the e-learning resource extremely positively and would recommend the source to others. The discussion focuses on that the teachers generally have low knowledge of the learning areas most difficult for the preterm born children and that this may lead to frustration and bad behavior later in school if not recognized. Why these problems are not recognized is not discussed, however, preterm born children are often withdrawn and do not act out like children with ADHD or other learning problems often do. The authors emphasize that increased

	knowledge by teachers does not prove that school performance also increase in children born preterm. This has to be evaluated. One important issue taken up in the discussion is the importance of health workers and education professionals working together and sharing information. Equally important is including the parents and sharing information with them. Another important point in the discussion is survival and prognosis for children born preterm. The common belief is that modern neonatology has improved both the survival and the cognitive, social and mental outcome of preterm born children. However, the same learning problems seem to persist and a growing number of children are in need of special education. The authors point out that more learning resources will have to be available for a growing number of children. The e-learning resource can be used by teachers free of costs and may be a very useful tool for meeting the increasing demand for more teachers with knowledge of the impact of prematurity. The need for appropriate and optimal education for preterm born children was the background for the development of the e-learning resource and making the resource open and available without costs. Finally, the impact of participation of mostly female teachers and teachers with previous knowledge of children born preterm is discussed. Ninety percent of the participants being female turns out to be the average number of teachers from 5-11 years in school, and previous knowledge of preterm born children does not increase an insight in learning problems and special education for the same group. If the authors of this study decide to include classes of older children, the female imbalance may change, since there are more male teachers for older children. One misses the discussion whether teachers of older children also are in need of an e-learning resource, since some problems are certain to persist and maybe even increase, as the children grow older. Especially in the teenage years, knowledge of specific learning problems and supporting the teenagers is very important. If children drop out of school, several of them will have a bleak future. The authors are planning new studies about the impact of the increased knowledge of preterm learning problems by teachers. This is of great importance, and we are looking forward to the results of this new study. In summary, this is an extremely interesting study and may have an important impact on the lives of children born preterm. Many have studied learning problems in children born preterm. This study is the first to develop a tool that may finally lead to better education for preterm born children with the hope for a better future for most of them. The authors are congratulated on the idea of the study, the way it was planned, the involvement of parents of children born preterm and adults born preterm and the enormous work of many researchers that was carried out in planning and executing the study. The next step, examining whether increased knowledge by teachers results in improved learning in children born preterm, is eagerly awaited.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

This study evaluated the efficacy of an e-learning resource that was aimed to improve teacher's knowledge of developmental and educational outcomes of children born preterm and teacher's

confidence to support these children in the classroom. With the development of this resource, the authors fulfilled the need for an evidence-based resource for those who work with preterm born children and on whom we actually rely with respect to the identification of problems in this population, given that the routine follow up of preterm born children is generally limited to the infancy period. The article is well-written and the e-learning resource seems particularly well-designed. I appreciate the involvement of important stakeholders in the development process, which increases the likelihood that the resource fits the needs of the target population. My comments and considerations are as follows:

1. The focus of the introduction is mainly on academic difficulties after preterm birth. However, children born preterm show difficulties across a wide range of developmental domains. Although participants of the present study were teachers, they are not only concerned with the academic progress of their pupils. Fortunately, the e-learning was not exclusively focused on academic outcomes, but also on cognitive, motor, behavioral, social, and emotional outcomes after preterm birth. However, that only became clear after reading the Methods section and the Appendix. I think it is important to take a broader view on the consequences of preterm birth in the Introduction, so that the Introduction provides support for the content of the e-learning resource.

Authors' Response: We have amended the opening paragraph and included relevant references as suggested. This now reads: Preterm birth places children at increased risk for a range of developmental problems and disorders later in life. The most common adverse outcomes are intellectual impairments, deficits in working memory, visuospatial skills, processing speed and executive functions, and attention, social and emotional problems.(1-3) As these difficulties can have a profound effect on a child's performance at school, it is unsurprising that children born preterm are at increased risk for special educational needs (SEN) and poorer academic attainment compared with their term born peers.

2. Introduction, third paragraph: It would be clearer to state that the aim was not to improve knowledge of preterm birth, but knowledge of the consequences of preterm birth (or both), as this is what the e-learning is mainly about, according to Table S1.

Authors' Response: We have amended this. It now reads: The aim of the present study was to evaluate the efficacy of this resource in improving teachers' knowledge of the consequences of preterm birth and their confidence in supporting the learning of children born preterm.

3. Unfortunately, the resource was not yet accessible at the time of reviewing this manuscript. The paper itself does not provide much information about the content of the e-learning resource. Is the content of the e-learning directly linked to the items of the PB-KS? Does the resources provide explanations of what for example cerebral palsy, working memory, ADHD, and ASD is? If someone is taught that children born preterm are likely to have working memory deficits without knowing what working memory actually is or how such problems are actually reflected in daily life functioning, it is less likely that this specific knowledge will have an impact on the support and outcomes of children. I assume the resource does include such explanations and does not literally present the information that is asked for by the items of the PB-KS, but my point is that this does not become fully clear from reading the paper. My suggestion therefore is to provide more information about the content of the e-learning resource. From Table S3 (item 8), I infer that for each section of the e-learning resource (the 5 RLOs?) learning objectives were formulated. It would be informative to the reader to provide such information in the paper. I would suggest to at least name the subjects of the RLOs in the Methods section and to expand Table S1 with the specific learning objective and/or a short summary of the content of each section.

Authors' Response: The resource will be made available upon publication of this manuscript. We can confirm that the resource includes explanations of all of the cognitive processes and behavioural problems and disorders referred to. These are included in the main body of the resource and also in a glossary available at the end of the resource. Taking working memory as an example, this section includes a description and a video demonstrating what working memory is and the difference between short term memory and working memory. We also provide examples of how working memory problems might cause difficulties for children's learning and how teachers might alter their classroom practices to support children with working memory deficits. As suggested, we have named the subject of the five individual RLOs in the methods section. See the highlighted text on page 8 which now reads: The focus of each of the RLOs is as follows:

RLO 1: What is preterm birth?

RLO 2: Educational outcomes following preterm birth

RLO 3: Cognitive and motor development following preterm birth

RLO 4: Behavioural, social and emotional outcomes following preterm birth

RLO 5: How can education professionals support children born preterm?

We have also listed the learning objectives for each section in the supplementary appendix – see the highlighted text in Table S1, supplementary appendix.

4. Which strategies were provided to teachers to support preterm born children in the classroom? Are these strategies that have been found to be effective in the general population or other clinical populations? Can these strategies be broadly applied (e.g. in different school settings, across grades, in different countries, etc.)?

Authors' Response: The strategies suggested were drawn up by members of the team with expertise in developmental psychology and education and were based on educational research. The resource focuses on general strategies that can be applied easily in the classroom and in wide variety of settings, e.g. across age groups and different educational contexts. These were selected to enable teachers to adapt the environment to support the development and learning of children with the common difficulties associated with preterm birth (i.e., inattention, slow processing speed, working memory deficits, anxiety and peer relationship difficulties). During development the resource was reviewed independently by two teachers who provided positive feedback on this element of the resource.

5. Teachers were asked whether they would consider prematurity when encountering a child struggling at school (Figure 1). However, the other way around may be even more important: being aware of the developmental and learning difficulties that are commonly associated with preterm birth when having a preterm born child in your classroom. As the authors state in their Discussion, it is increasingly the role of teachers to identify preterm born children with difficulties and to initiate support. To this end, it may be more effective that teachers are aware of the preterm birth status of children in their classroom, so that (subtle) difficulties may be identified at an early stage, instead of considering preterm birth when problems are already evident. Table 1 suggests that many teachers (34%) do not know whether children are born preterm or not. If we expect teachers to identify preterm born children with difficulties, preferably at an early stage (whether this is a fair expectation or not), should teachers then not be aware of the birth status at school entry? Does the e-learning resource provide any advice on this?

Authors' Response: The resource highlights that most children born preterm will not receive routine follow-up, and even those born very preterm might only receive this over the first few years of life. The resource does recommend that it might be helpful to consider birth history when a teacher encounters a child who is struggling in school, but it does not provide a recommendation that the carers of all children should be asked about their gestation at birth on school entry. This is because policies may differ with respect to this, even within the UK, and as we wished the resource to be used throughout the world we were mindful to avoid making recommendations that might contradict local policies. In addition, the issue of disclose of birth status is a contentious one among parents as many do not wish to disclose their child's birth history to the school. Therefore, our recommendation was to consider prematurity when encountering a child who struggles at school.

6. While 120 teachers consented to participate in the study, only 61 completed the e-learning and questionnaires. Do the authors have an idea why about half of the potential participants did not participate in the end? Is it possible that teachers who already had some knowledge on preterm birth outcomes were more likely to finish the pre-resource questionnaire, while those without any knowledge were scared off by the questions or ashamed that they could not answer them? Would the teachers who did not finish the pre-resource questionnaire still be interested to access the e-learning resource outside the study setting or could it indicate that e-learning itself is not appealing to a large proportion of teachers? In other words, could the high drop-out rate have biased the results of the study in any way? I think some discussion on this issue should be added to the limitations section in the Discussion.

Authors' Response: We do not have the 1st PBKS scores for most of the participants who did not complete the study and therefore we are unable to compare these at baseline. We too considered that those who completed the study may have greater interest in the topic with greater prior knowledge thus biasing the results, but as we already present in the discussion, the mean pre-resource use PBKS score for those that completed the study was 13, which is lower than the mean score of 15 previously observed in our national survey. Thus we do not feel the results were biased in this respect and we believe we have a sample that is representative of teachers nationally in terms of knowledge of preterm birth. We also note that the gender distribution of our sample was similar to that of teachers nationally. Rather, in hindsight, we feel that the method we opted to use to allow secure access to the resource before it was released and to collect evaluation data may have been too cumbersome. It is therefore more likely that IT related issues, including difficulties setting up and accessing an account, was too time consuming for participants and may have put them off completing the full study. This will not be the case using the resource when it is released as it will be freely available from a website. We have added the following to the discussion on page 14/15: We also note that of the 120 teachers who consented to participate, 61 completed the full study. It is possible that method used to allow secure data collection and access to the resource may have been too cumbersome or time-consuming and may have discouraged completion of the study. This process was only implemented for this study and is not required to access the resource that is freely available for use online.

Reviewer: 2

An impressive group of psychologists, educational experts, medical specialists, and researchers are the authors of this paper. The authors have developed an interactive e-learning resource for educational professionals with the aim to increase their knowledge of the impact of preterm birth on the children's ability to learn and to enhance the outcome of education for children born preterm. This may be a very big and novel step forward for the education of these children and the authors are to be congratulated on the initiative. The abstract gives a good overview over the design of the

development of the e-resource, the results and the relevance of the paper. In the relevance section, the authors emphasize that the special educational needs and poorer academic attainment is a risk for children born preterm and may have a lifelong impact on their lives. The aim has been to increase teacher's knowledge of the impact of preterm birth on learning and social skills by use of the e-learning resource. They also emphasize that further research is needed to evaluate whether this will lead to better learning in school for the children born preterm.

In the introduction, the authors describe previous knowledge of learning difficulties in preterm born children and the earlier in pregnancy the children are born, the higher the risk for special educational needs and support in school. However, also children born later in pregnancy can have the same difficulties and may get less attention by teachers. The authors point out that the future of preterm born children are dependent on teachers with knowledge of their learning difficulties and that recent literature show that such knowledge is lacking. This is the background for the development of the e-learning research in the present study.

The Methods section is divided into Participants, Procedure, Preterm birth e-learning resource, Patient and Public involvement and Measures. The participants and how they can enter the e-learning resource comes before development of the resource. The six subtopics of the methods indicate an impressive amount of work laid down by the researchers and all other participants in making the study a success.

Participants. The head teachers of the various schools invited the teachers to participate. Involving the head teacher seems a very smart way of securing optimal participation. The number of possible participating teachers is not given. While many teachers agreed to participate, only half of them entered the study. Together, this may imply selection bias.

Authors' Response: Please see our response to Reviewer 1 point 6 that deals with this issue.

Procedure. After Formalities, the participants had to set up a personal account on an open-source learning platform, fill in study questionnaires and access the e-learning resource. They then had to log into their account to complete the pre-resource use questionnaires and finally got access to the e-learning resource. When finishing using the resource, they filled in a post resource questionnaire on the online platform. Six participants (10%) had trouble using the platform and needed help. Some potential participants may have been discouraged by the procedure before trying to use the e-learning platform. The authors do not mention whether help or a training course was available for participants.

Authors' Response: As noted in our response to Reviewer 1 point 6, we feel that the method we opted to use to allow secure access to the resource before it was released and to collect evaluation data may have been too cumbersome. It is likely that IT related issues, including difficulties setting up and accessing an account, made it too time consuming for participants and may have put them off completing the full study, even though IT assistance was provided by the study team. This will not be the case when using the resource when it is released as it will be freely available from a website. We have added the following to the discussion on page 14/15: We also note that of the 120 teachers who consented to participate, 61 completed the full study. It is possible that method used to allow secure data collection and access to the resource may have been too cumbersome or time-consuming for participants and may have discouraged completion of the study. This process was only implemented for this study and is not required to access the resource that is freely available for use online.

Preterm birth e-learning resource. This section describes the development of the interactive e-learning object that stimulates to active learning and skills within the area of cognitive, mathematics and social-emotional difficulties, learning problems typical for children born preterm. This is probable

a very rewarding and interesting way of learning and facilitate frequent use. For the development of the e-learning resource, educational professionals and psychologists, but also parents of children and young adults born preterm were included in creating the resource. For parents and preterm born adults, this must be a dream come true, many of them have struggled to inform teachers about their children's problems with varying success. All participated in building the content of the resource with feedback to the participants, including parents of preterm born children and preterm born adults. This means that they included the real life experts on the impact of preterm birth on learning problems and social skills. The inclusion of the real-life experts also increases the chances that better teaching will lead better school outcome and more integration in society by this group.

Measures. To assess the knowledge the participant teachers had of preterm born children and their problems before and after using the e-learning resource, the authors used the Preterm Birth Knowledge Scale (PB-KS). To assess confidence in supporting learning of children born preterm, the authors used a 5-point Likert scale used in similar studies before. The authors also collected information about age, experience in teaching, professional roles and gender, information that may influence the results.

Statistics. Appropriate statistics was used to analyze the data.

Results. Although 120 teachers agreed to participate, only 71 filled in the pre-resource questionnaire, while ten more left after filling in the questionnaire. One may speculate whether these teachers found the procedure of entering the e-learning resource too difficult, the age of the teacher may also play a role. Almost all of the participating education professionals had some knowledge of children born preterm and most of them were females. This may also have had some influenced the results of the study.

Authors' Response: Please see our previous response to this reviewer and also our response to Reviewer 1 point 6 which deals with these issues.

The participants were teaching children from 5-11 years. The authors do not mention why they did not include teachers for older children. Learning material for older children include more abstract and difficult topics and children with preterm background are often in need of extra support to finish school. A reason for not including teachers of older children may be that a new e-learning resource would have to be developed for teachers of older children. However, with improved and focused teaching in younger classes, the children may have a better base for handling more advanced material in higher classes and give them an advantage compared to children without earlier support.

Authors' Response: The resource was developed to be of interest and use to teachers of children of all ages and the strategies included in the resource were selected to provide general strategies that could be applied easily in the classroom and in wide variety of settings, including in secondary schools and in other countries (see response to Reviewer 1, point 4). Thus our intention is that the resource can be used by all teachers. Prior to the evaluation study, the resource was reviewed by one primary school and one secondary school teacher, both of whom reported that the resource was pitched at an appropriate level and was relevant and helpful for their practice. Unfortunately, we only had sufficient funding and resources to conduct the present study, but full evaluation of the utility of the resource in different groups of education professionals, including secondary school teachers and educational psychologists, will be the focus of our future work, subject to further funding. We have added this to the discussion on page 15 as follows: Although this study included only primary school teachers, in future research we plan to evaluate the utility of the resource in different groups of education professionals, including secondary school teachers and educational psychologists.

Knowledge of preterm birth. A highly significant increase in PB-KS score was seen after the participants had used the e-learning source compared to before. These results are very encouraging and indicate that the use of the e-learning platform may help both preterm born children, teachers and parents. Problems with mathematics had highest score for increased knowledge by the participants. This is encouraging since problems with mathematics is the most common learning problem in children born preterm. The participants also scored high on the topics of social skills, inattention and visuospatial deficits after training. For understanding the child, these areas are important, but some of these areas, like visuospatial deficits may be difficult to improve by more targeted teaching since this may be caused by altered brain structures involving both brain and eyes.

Authors' Response: We acknowledge this point, however the resource doesn't aim to lead to improvements in these skills. Rather it aims to inform teachers how to support children with these difficulties so that the negative impact on their learning is reduced.

The PB-KS scores does not indicate which answer is the right one, and may cause some confusion by the participants. Some with little or no knowledge of the impact of prematurity may believe that that 20% of the children are blind or deaf or that all preterm born children born very early have cerebral palsy.

Authors' Response: Correct answers were not provided for PBKS items as this was used as our outcome measure pre and post resource use to test knowledge. However, the content of the resource provides sufficient information for teachers to be able to answer these questions. The accuracy of PBKS items is provided in the publication detailing the results of our national survey: Johnson S, Gilmore C, Gallimore I, Jaekel J, Wolke D. The long-term consequences of preterm birth: what do teachers know? Dev Med Child Neurol. 2015;57(6):571-7.

Confidence in supporting the children born preterm Confidence in teaching the preterm born children also showed a large significant increase, 93% of the teachers felt confident after using the e-learning resource versus 23% before. This is an important effect, laying the basis for their teaching initiative and effort. They also indicated that they would ask a struggling child whether he or she was born preterm. In young children, it would be advisable to ask the parents instead, in order to avoid over-focusing on the child's problems in the class. Also, other pupils could start to mob the child if they found out. Asking the child may also be difficult, because for instance alcohol use in pregnancy may result in similar learning problems in children.

Authors' Response: To allay any concerns, we can clarify that teachers weren't questioned about whether they would ask the child directly if s/he was born preterm. As shown in the supplementary appendix the specific question was: When I encounter a child who struggles at school/in the classroom, I consider whether or not they were born preterm. Please also see our response to Reviewer 1 point 5 as this deals with the issue of disclosure of birth history.

Utility of the learning resource. Despite problems with using the e-resource for some participants, 93% would recommend the resource to others and between 92%-100% of the participants in the study gave an extremely positive evaluation of the resource. This may indicate that the e-resource described in this study can also be used in the education of new teachers. This would benefit more children with similar learning problems.

Authors' Response: It is our intention that the resource could be used in initial teacher training and we intend to explore such possibilities for implementation.

Discussion. The discussion is very well written and contains the benefits and potential problems of the study. The authors emphasize that using the e-learning resource increases the knowledge of the specific educational needs for children born preterm and that almost 100% of the teachers rated the e-learning resource extremely positively and would recommend the source to others. The discussion focuses on that the teachers generally have low knowledge of the learning areas most difficult for the preterm born children and that this may lead to frustration and bad behavior later in school if not recognized. Why these problems are not recognized is not discussed, however, preterm born children are often withdrawn and do not act out like children with ADHD or other learning problems often do. The authors emphasize that increased knowledge by teachers does not prove that school performance also increase in children born preterm. This has to be evaluated. One important issue taken up in the discussion is the importance of health workers and education professionals working together and sharing information. Equally important is including the parents and sharing information with them. Another important point in the discussion is survival and prognosis for children born preterm. The common belief is that modern neonatology has improved both the survival and the cognitive, social and mental outcome of preterm born children. However, the same learning problems seem to persist and a growing number of children are in need of special education. The authors point out that more learning resources will have to be available for a growing number of children. The e-learning resource can be used by teachers free of costs and may be a very useful tool for meeting the increasing demand for more teachers with knowledge of the impact of prematurity. The need for appropriate and optimal education for preterm born children was the background for the development of the e-learning resource and making the resource open and available without costs. Finally, the impact of participation of mostly female teachers and teachers with previous knowledge of children born preterm is discussed. Ninety percent of the participants being female turns out to be the average number of teachers from 5-11 years in school, and previous knowledge of preterm born children does not increase an insight in learning problems and special education for the same group. If the authors of this study decide to include classes of older children, the female imbalance may change, since there are more male teachers for older children. One misses the discussion whether teachers of older children also are in need of an e-learning resource, since some problems are certain to persist and maybe even increase, as the children grow older. Especially in the teenage years, knowledge of specific learning problems and supporting the teenagers is very important. If children drop out of school, several of them will have a bleak future.

Authors' Response: As noted in response to this reviewer's comment above, with further funding we intend to explore the utility of the resource in improving knowledge and confidence with other teachers and have amended the discussion on page 15 to include the following; Although this study included only primary school teachers, in future research we plan to evaluate the utility of the resource in different groups of education professionals, including secondary school teachers and educational psychologists.

The authors are planning new studies about the impact of the increased knowledge of preterm learning problems by teachers. This is of great importance, and we are looking forward to the results of this new study. In summary, this is an extremely interesting study and may have an important impact on the lives of children born preterm. Many have studied learning problems in children born preterm. This study is the first to develop a tool that may finally lead to better education for preterm born children with the hope for a better future for most of them. The authors are congratulated on the idea of the study, the way it was planned, the involvement of parents of children born preterm and adults born preterm and the enormous work of many researchers that was carried out in planning and executing the study. The next step, examining whether increased knowledge by teachers results in improved learning in children born preterm, is eagerly awaited.

Authors' Response: Thank you for reviewing our manuscript.

VERSION 2 – REVIEW

REVIEWER	Sabrina Twilhaar Vrije Universiteit Amsterdam, The Netherlands
REVIEW RETURNED	11-Apr-2019

GENERAL COMMENTS	The authors have sufficiently addressed the previous comments and suggestions. I have no further comments.